



Applications are invited for the following posts, for which applications close on the dates shown. SALARIES (unless otherwise stated) are as follows:

Senior Lecturer SA18,350-
SA21,550; **Lecturer** SA13,550-
SA17,050; **Senior Tutor** SA14,050-
SA17,375; **Tutor** SA8,465-SA11,841.
Further details, conditions of appointment for each post, method of application and application form, where applicable, may be obtained from the Association of Commonwealth Universities (ACU), 38 Gordon Square, London WC1H 0PF.

Deakin University
Geelong

ACADEMIC APPOINTMENTS IN ACCOUNTANCY AND FINANCE

The University wishes to appoint a person of a level appropriate to qualifications not exceeding up to the grade of Senior Lecturer, to teach Accounting and Finance in its School of Business Studies. Applications are invited from persons who possess appropriate academic and professional qualifications both to teach and undertake research. 17 December, 1976.

ACADEMIC APPOINTMENTS IN EDUCATION

The University is seeking to appoint academic staff (Senior Lecturer/Senior Lecturer) in the School of Education in 1977. Applications are invited from persons with higher degrees relevant to one or more of the following areas:

- (1) Cognitive psychology with research interests in attention, memory, reasoning and experience in information processing.
- (2) Computer simulation and on-line control of experiments.
- (3) Developmental psychology with research interests in perceptual development, language and psycholinguistics.
- (4) Curriculum design, development and evaluation.
- (5) Educational research in methodology.
- (6) Educational research with special interests in individualisation of learning, interaction analysis or behaviour modification.

10 December, 1976.

Griffith University
Brisbane

LECTURER: SCIENCE, TECHNOLOGY AND SOCIETY

The Griffith University School of Science, Technology and Society is seeking to appoint a Lecturer in the teaching of Science, Technology and Society at the postgraduate level. The appointee will be involved in the teaching of courses in Science, Technology and Society at the postgraduate level. The appointee will also be involved in the research and development of Science, Technology and Society. Applications are invited from persons with higher degrees relevant to one or more of the following areas:

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10 December, 1976.

Speak with Dr. Humayun (Griffith University) who will be in the UK from 15 November to 1 December. He can be contacted via the Association of Commonwealth Universities (Tel. 01 387 8712, ext. 46).

La Trobe University
Melbourne

LECTURERS IN THE USE OF ENGLISH

The School of Humanities wishes to appoint an adviser at Lecturer level to deal with the problems of students in the use of English in all its aspects. The appointee will be involved in the teaching of courses in the use of English in all its aspects. Applications are invited from persons with higher degrees relevant to one or more of the following areas:

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10 December, 1976.

It is highly desirable that the appointee has a qualification in any discipline taught in the school with Honours level or higher in Applied Linguistics. (2) Experience in teaching English language and/or literature. (3) Experience in teaching English as a second language. (4) Experience in teaching English as a foreign language. (5) Experience in teaching English as a second language. (6) Experience in teaching English as a foreign language. 3 January, 1977.

LECTURERS/ SENIOR LECTURERS DEPARTMENT OF SOCIOLOGY

Applications are invited from people interested in teaching Sociology at both introductory and advanced levels. The department, with a staff of thirty-seven, offers a wide variety of core and specialist courses. It also provides excellent opportunities for research, both in the department and in the body of graduate students are involved in research projects. 3 January, 1977.

LECTURERS IN CINEMA STUDIES (Two positions)

The Centre for Educational Communication and Media, School of Education, at present offers a cinema studies degree in the School of Humanities. The Centre wishes to make appointments in the following areas of specialisation: (1) The study of national or regional cinema, particularly those of France, Italy and/or Spanish-speaking countries, and (2) the sociology of film. The positions are for a fixed term of three years, commencing in September 1977. The Centre's B.Ed. and higher degree programmes in the School of Education would also be expected. 20 December, 1976.

TUTOR/SENIOR TUTOR SCHOOL OF ECONOMICS

The appointment will be in general economics (macro or micro) or accounting. It commences early in 1977.

UNIVERSITY OF MELBOURNE LECTURER IN DRAMA (TENURE) IN DRAMA

Faculty of Arts

QUALIFICATIONS: Academically qualified with experience in practical drama. The appointee will be involved in the teaching of courses in the Faculty of Arts. The appointee will also be involved in the research and development of Drama. Applications are invited from persons with higher degrees relevant to one or more of the following areas:

- (1) Cognitive psychology with research interests in attention, memory, reasoning and experience in information processing.
- (2) Computer simulation and on-line control of experiments.
- (3) Developmental psychology with research interests in perceptual development, language and psycholinguistics.
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10 December, 1976.

Trusts examine effects of financial difficulties

by Judith Judd and David Walker

The effects on independent foundations of the universities' financial difficulties are discussed in reports published this week by the Leverhulme Trust and the Nuffield Foundation.

The review of the work of the Leverhulme Trust between 1971 and 1975 says that such foundations are becoming increasingly important for basic academic research as Government policy shifts towards applied and short-term work.

The Nuffield report warns that the foundation has been forced to reconsider its previous policy of undertaking to meet all nationally agreed salary increases to research workers on its grants.

The report says that "1975 showed all too clearly that British institutions of higher education are in danger of being made free by the rigidity of rules which now determine academic appointments and salaries."

During 1975 the foundation spent more than 15 per cent of what it allocated as grants on what the country's university bursars appear to know as "supplementation".

The cost of one grant increased by more than half because the research assistant appointed to do the work was more than 26. There was also a request from an unnamed university for an indemnity against liability for redundancy payments.

The report discloses that the foundation has faced severe financial difficulties because of the collapse of British Leyland.

At the time of the Government's offer for shares in August 1975 the foundation still held 25 million shares which had to be sold for 10p each.

During 1975 the foundation's grants totalled just over £750,000. From this year it is expecting an income of about £1.5m a year. Its income last year was nearly £1.7m.

Support from independent foundations for basic academic research is becoming increasingly important as government policy shifts towards applied and short-term work, according to the reports.

The focus of Leverhulme's work continues to be in the social studies, education which together receive a fifth of all grants. Medicine, humanities and basic sciences took an eighth each, with the rest of the money distributed among physics, combined studies, applied science, regional studies and library work.

The Eighth Report of the Leverhulme Trust for 1975-76, 15-19 New Fetter Lane, London EC4A 3NR. The 30th report of the Nuffield Foundation, Nuffield Lodge, Regents Park, London NW1 4RS.

The savings are scheduled to start in September when £5m will be cut from the subsidy. A DES spokesman told the TES this week: "Eighteen authorities are currently being consulted. This sampling idea came from the local authority associations."

The scheme, put forward by the Department of Education and Science, is expected to bring about increases of between 25 and 50 per cent in residence and catering charges for the 700,000 students in polytechnics and colleges.

Students at universities pay nearly the full economic cost for accommodation and food but those in the

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The trust, which last year had a gross income of £1.69m, finds itself making it more difficult for them to maintain their traditional role in carrying on basic work in all their fields of study. The "dual-support" system through which the research councils and universities share research costs is endangered.

Concentration on short-term issues against a background of increasingly diminishing resources, may well swing the balance (so far) in the direction of applied or short-term research to the detriment of longer-term consideration, a tendency which is admittedly found under such circumstances in most enterprises but which is none the less regrettable," the report says.

During 1971-75 the work of the Leverhulme Trust was affected by the general inflation and by increases in academic pay which were greater than growth in its income. Real resources at its disposal fell in 1974 and last year.

None the less, during the five-year period the trust accepted new commitments amounting to over £5.7m for projects of varying length, increasing preference has been shown for shorter projects in order to ensure a degree of flexibility in the face of inflation. Over four-fifths of such work is under the heading of research, with the rest under studentships, bursaries and grants for conferences and travel.

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DES gives list for debate

A list of organisations

constituted in the month started by the Prime Minister announced this week by the Department of Education and Science.

The department intended to guide the way in its preparation of a paper on education of teachers in the future.

The paper will be discussed with the Association of Teachers in Education, the Association of University Teachers, the Association of Metropolitan Authorities, the Association of Principals and the Association of School Governors.

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November 26, 1976. No. 266

British Council and universities split on overseas role

by David Walker

A serious academic demarcation dispute between the British Council and the universities' council for overseas cooperation will be re-examined in a report on aid from universities and polytechnics to developing countries, to be published shortly.

In recent years, according to one of the report's authors, the British Council and the Inter-University Council for Higher Education Overseas have been in "friction and irritation" over the aid from universities and polytechnics to developing countries, to be published shortly.

The report, prepared by a committee led by Sir Michael Swann, chairman of the BBC and former principal of Edinburgh University, is likely to recommend a rationalisation of the development effort of the universities and polytechnics by means of a merger of the IUC and the British Council.

The IUC's 50-strong secretariat and the £2m budget would be absorbed into the council but there would be safeguards so that the special needs of the universities and their independence would be recognised.

The work of universities and polytechnics in developing countries is a responsibility of the British Council, the IUC, the Ministry for Overseas Development, international agencies such as the Food and Agriculture Organization and new quasi-autonomous ventures such as Paid Educational Services. On the sidelines, with an interest, are the Department of Trade, the Association of Commonwealth Universities, and the Department of Education and Science.

A year ago, in response to a conference of interested parties at Reading University and the DES, a committee was set up to examine the "perpetual squabbling" between the British Council and the IUC, Sir

Michael Swann-anxious to produce realistic report.

IUC and such lucrative new ventures as Paid Educational Services—the educational package being sold in the Middle East and Venezuela.

Basically Sir Michael's task is one of persuasion, for the IUC is legally a company limited by guarantee and would need to wind up its own affairs. Its staff favour a merger with the British Council but what one of them called the "academic sticklers" on its executive still need to be convinced.

The report was particularly critical of DES reluctance to make this material, including PARS, available, and recommended greater openness through publication and through more flexibility in using the confidentiality rules.

It also recommended a Standing Education Commission which would provide an independent view of strategic planning.

This the Government firmly rejects. It says it has every sympathy with the committee's feeling that there is a need for "wider and more open review and informed public discussion of educational policy" but believes it would be better secured by seminars and conferences in regional centres as well as London.

It believes a commission would be ineffective and slower than the department's own planning organization which it would largely duplicate.

The reply says the Government is fully aware of the danger that day-to-day pressures may interfere with the ability of senior officials to attend to long-term planning. The DES already intended to strengthen and reorganize its planning arrangements.

The Government believes that the contrast between the way short and long-term planning is handled is based on a misconception, though it agrees there should be regular reviews of policy objectives.

The committee urged the research and development of the new planning command is to investigate what action can be taken over this. Monitoring of research carried out by the National Foundation for Educational Research and the Schools Council is also to be improved.

From next year the planning branch will be the responsibility of one of the department's senior officials, Mr. Howard Simpson, deputy secretary. It will include the present planning unit, continued on back page

The policy of some authorities of limiting attendance to colleges within their own area is also likely to work against women. The commission says the DES should establish a policy of "free trade" across neighbouring boundaries.

The commission wants a dialogue between the DES and the I.U.C. to monitor precisely how discretionary awards are administered. It also wants the DES to monitor and evaluate the effect of both parental and awards means testing on the award of discretionary grants. In students of both sexes.

The system is heavily weighted in favour of full-time students and many women can only follow part

time courses to top up basic education or retrain because of domestic commitments, it says.

The commission believes that inconsistent and stereotyped judgments from I.U.C. work to the disadvantage of women. It feels that the discretionary awards should be used for general education "topping up" courses will mean fewer people receive support and that it will fall harder on girls.

The 100 different discretionary schemes lead to a decided reinforcement of regional or local prejudices, especially in the north. While women find it harder to be accepted on motor vehicle maintenance courses, for technical training and in construction, men, too, have problems in being accepted for courses in typing and beauty therapy.

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Companies crash brings legal threat to NUS

by Peter Wilby

The National Union of Students may find itself in a legal battle over whether it is a company or an association of its service companies.

The Union has lost around £50,000, the collapse of its service companies which had a combined turnover of £500,000.

Members of the union's executive, who have half the places on the services board, are anxious to recover the losses and to restore the union's financial soundness by running the highly profitable Endsurance business.

But their plans are being opposed by two other directors of the services board, representatives of the union's finance committee, a watchdog committee of former NUS conference.

Their opposition narrowly averted a decision to sell at last week's meeting of the services board. Another meeting was being held yesterday.

The two directors—Mr. Mike Hill, a permanent union officer at Salford Polytechnic, and Mr. Jeff Stanfield, who holds a similar position at Warwick University—have taken legal advice and believe that if the insurance company is in a position to continue trading, it should be wound up without the approval of the NUS conference.

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More finance details demanded

by Frances Gibb

The Home Office appears to be stepping up its supervision of overseas students with new demands for detailed information about their personal finances.

Overseas students at Middlesex Polytechnic are claiming that for the first time some of them have been required to submit detailed information about their bank accounts, what they intend to do on graduating and, in several cases, to give a receipt from the polytechnic to show that they have paid their fees in full.

Until the information has been supplied, the Home Office is retaining the students' passports. One social sciences student claims his passport has been held since the beginning of September, whereas last year it was held for only five weeks.

The polytechnic's administration buildings have now been under occupation for two weeks in protest against the treatment of overseas students. There is particular concern about the likely effects of the proposals to increase fees.

A student's union meeting last week, attended by some 600, overwhelmingly agreed to continue the occupation until their demands were met. They want the Committee of Directors of Polytechnics to make a firm statement against the Department of Education and Science circular on the admission of overseas students, the fee increase proposals and the proposal for a quota system for overseas students.

Those affected by the new regulations seem to be chiefly from India, Ceylon, Pakistan and Bangladesh. The information required is not the same in each case.

One Home Office letter to a Ceylonese third year engineering student who is privately sponsored, said that in order for his application for an extension of stay to be considered the following information, giving documentary evidence where requested, was required:

- An itemised bank statement showing deposits and withdrawals for the past six months, in its original form (not photocopied).
- A sponsor's letter was not sufficient.
- College receipts for fees paid for the 1976/77 academic year.
- Meanwhile, we are retaining your passport in this department, pending your reply," the letter went on.

One head of department at the polytechnic said for the first time he had been asked by the Home Office to supply additional information about two Indian students on his course. In one case he was "satisfied" in another, he had to state whether the student had attended his course for at least 15 hours a week.

It is the first time that students have been required to show their fees have been paid in full at the



The barricades are up—Middlesex Polytechnic students are occupying the administration block in protest against the Government's treatment of overseas students.

start of the year. Normally they are paid by instalments.

So far no student has been prevented from continuing his course through lack of money but some have had to go to considerable lengths to raise the sum.

Students are claiming the new regulations are part of a general tightening-up of regulations that has been going on in the past couple of years. They say it has become extremely difficult now to renew their visas for further study at the end of a first degree even though they had stated their intention of so doing before coming to Britain. A Home Office spokesman said as far as he knew there had been no change of policy but the Home Office had the means to establish that students had the means to support themselves during their stay. He said, if there was any doubt, they could ask for further evidence.

● Students at Teesside Polytechnic staged an occupation of the college's

Dons bitter over income policy loopholes—Can

University professors would earn more as postmen in the United States than in their present jobs, Mr Charles Carter, vice-chancellor of Lancaster University, says in his annual report for 1975/76.

The disadvantage for academic staff in having their income held 20 per cent or more lower than is admitted to ought to be is beginning to have its inevitable effect, he says. This was evident not only in hardship for those of all ages with fixed commitments, but also in the drain of talent overseas and the difficulty of filling essential posts.

There was also great bitterness that the Government and civil service seemed to find it possible to discover loopholes for more favoured groups, while the injustice to university staff looked like continuing indefinitely.

"If nothing is done, and if economic activity is high in the rest of the world, the trickle overseas will become a torrent; and those lost will include many who could have contributed to the revival of Britain, but whose duty to their families is stronger than their sense of duty to a country which has 'treated them so badly'."

In a time of troubles, universities had to protect certain essential values. They must firstly maintain standards. The country has no need of students allowed to drift through courses and to succeed in easy examinations by the purchase of their examinations; but it has a great need of those whose minds

have been developed for purpose and who are not material and profit men. Universities must be able to attract the world's best brains, only those who can contribute to national progress, but teachers and their links with the world's universities.

Scholars in English had to be effective in a world of men and women who write it so badly. Students should be constantly exposed to the best of the world's literature and to the problems of knowledge. Academics tended to view the world as a series of problems to be solved, not as a series of things to be experienced.

Mr Carter said while further cuts without numbers might be forced, there was no way, however, of reversing the process without buying on the tenure at probably ruinous prices. He added that universities must assume the Government's role in the rescue of the country to become better.

Other board members, however, including two representatives of the union, "watchdog" finance committee, former student politicians elected by the conference, advised against it. They argued that the NUS ought not to be panicked into selling off its future assets.

In any case, they said, a decision to sell a major student service would be left to the annual conference next month. The finance committee members warned that if the board did decide to sell they would not support the decision.

But the NUS board is acutely conscious that they will need all the funds they can get at the conference. Even before the

How NUS companies became dead ducks

The blame must lie with successive executives and conferences

by Peter Wilby

NUS losses from the crash of its service companies last week include £175,000 made to the company and £43,000 under an agreement that enabled the banks to recover the company's debts.

A further loss was incurred because NUS headquarters had been paying monthly wages and national insurance contributions on behalf of the travel company recovering the money at a later date. The NUS must also meet the liquidator's fees.

Some estimates put the losses as £200,000. But, as a preferred creditor, the union can get some of the money back.

A key issue when the services board met last week was whether or not the union should attempt to recover its losses by selling its insurance company.

Endleigh Insurance was started in 1965 and, despite occasional setbacks, has been highly successful. It is now making a record profit of around £100,000 a year.

Half the members of the services board are elected members of the NUS executive. Charles Clarke, the president, Chris Morgan, the treasurer, Dave Aronovitch, vice-president, and Penny Cooper, vice-president, education. Their inclination was to sell the insurance company.

Other board members, however, including two representatives of the union, "watchdog" finance committee, former student politicians elected by the conference, advised against it. They argued that the NUS ought not to be panicked into selling off its future assets.

In any case, they said, a decision to sell a major student service would be left to the annual conference next month. The finance committee members warned that if the board did decide to sell they would not support the decision.

But the NUS board is acutely conscious that they will need all the funds they can get at the conference. Even before the



Where did it all go wrong? A pensive Mike Naylor (right), managing director of NUS Services, and Jeff Stanforth, NUS senior treasurer, at a press conference to announce the collapse of NUS travel and printing companies.

The blame must lie with successive executives and conferences. They failed to supply a clear picture of NUS companies should be non-profit-making services or purely commercial concerns.

Despite finance committee warnings that the travel company faced a difficult future, the conferences failed to give clear guidelines on the extent to which the NUS should jeopardise its own financial future to keep the company afloat.

To cut its losses, NUS Travel first curtailed its marketing and promotional activity, reduced the choice of flight routes, and later made a fifth of its 200 staff redundant.

But when the board met again last week, it was faced with the prospect of a £100,000 loss on the year due to end next May. The company had taken only £100,000 during the peak summer period. Instead of the £160,000 it had expected.

A further loan from the Australian Student Travel Service was available but the board felt unable

Seek out and recruit young people, Duke tells TEC

by Sue Reid

The Technician Education Council should have a primary responsibility to seek out young people and recruit them to its courses, the Duke of Edinburgh told the first national TEC conference for industrialists last week.

Prince Philip, president of the council, said that it should also become more closely associated with the curriculum available to 16-year-olds in their last compulsory year at school. Numbers were a vital factor in all technician training and a greater interest in it might be achieved if its practical applications were made more apparent in school.

"It seems to me wrong to cut off all further education as soon as technical training starts and I think it is equally questionable whether all technical subjects should be totally excluded from education in school."

Mr Neale Raine, chairman of TEC, said that today's standards of literacy and numeracy were a cause for concern to many industrialists. Teachers had a major part to play in educational policy making and their decisions affected the whole ethos and performance of the nation.

Industry and the people working in it were TEC's customers and if the council was to meet the needs of industry and students it was important to know what industry wanted done.

The first courses leading to the TEC awards were starting this autumn and next year there would be a major increase with many more courses and perhaps 50,000 or 60,000 students registered.

Closer links between education and industry training were advocated by Mr Francis Hauwitt, chief officer of the council.

The first "purpose-designed" TEC programme started in September. This year the council had validated 333 applications from colleges and approved 232. Most of those which had not been approved would begin next year.

In 1977 TEC expected development on a broader front. There could be 1,500 programmes running in about 250 colleges and by 1979 a substantial part of the programme of developing existing courses would have been completed.

Mr Frank Pidgeon, deputy chief officer of the council, said TEC programmes should be designed to satisfy the identified industrial requirements of technicians, senior technicians or equivalent personnel.

Cash limits anxiety rise

The academic year 1978/79 poses the greatest anxiety for university finance if rigid cash limits are continued and there is an increase in the rate of inflation, Lord Boyle of Handsworth, vice-chancellor of Leeds University, warns in his annual report for 1975/76.

"An error of forecasting of even three or four per cent, unaccompanied by supplementary cuts, will have consequences that would be truly alarming for the university as a whole," he says.

But Leeds University was saving an estimated £1.25m annually at current prices, which would make a difference during the present year when it is committed to further

medical expansion and a big cost of running the same. This figure was based on economies and a rise in the rate of inflation, Lord Boyle reviewed as a year of financial recovery, with the balance of the university's surplus at the end of 1976/77, and a surplus for the year 1977/78.

Savings were achieved, particularly in posts, by the end of the university had no less than £1.25m in savings, including cash and bank deposits, and a surplus of £1.25m at current prices, which would make a difference during the present year when it is committed to further

recognition of the association of Kirkcaldy has been much more than that of any other local authority. We expect other local authorities will now follow suit."

The decision, agreed by the Conservative-controlled council last week, represents a breakthrough for the APT which was formed three years ago and has until now been unrecognized as a negotiating body at either local or national level. But it has also brought the APT into renewed conflict with the Association of Teachers in Further and Higher Education.

Talks between the 100 strong Huddersfield Polytechnic branch of the APT and the Kirkcaldy Council began in 1978. Two previous applications to gain formal recognition failed because the council maintained the association was not a member of the Association for Further Education Committee.

Dr A. J. Poulton, national secretary of APT, said this week: "The

Delay may cost £350,000

Imperial College, London, could lose a benefaction of £350,000 from an anonymous donor because it cannot start building for which the money was intended in time.

Westminster City Council planning committee recently refused permission for an extension to the college's student accommodation in the Linstead Hall, Prince's Gardens. But the benefaction for the extension was conditional on building being started by next January.

The college authorities are under

'Revive Robbins proposal for SISTERS'

by David Dickson

The immediate designation of a number of universities as Special Institutions for Scientific and Technological Education and Research (SISTERS) was demanded this week by Professor R. H. Hasseldine, principal of the University of Manchester Institute of Science and Technology.

He said that when this step had been proposed 13 years ago by the SISTERS Committee, the intention was to create a special centre for higher education and innovative research in science and engineering.

Mr Robbins Committee's proposal had proved extremely effective in other advanced countries. It was a growing realization that the failure to implement this proposal lay at the heart of many of Britain's current economic problems.

The select committee's recommendations on SISTERS should be immediately endorsed by the Government and acted upon with all possible speed. An immediate statement of Government policy in this field is vital," Professor Hasseldine said.

Universities were in a state of complete uncertainty about their futures and their finances. They had no sure basis on which to plan creatively and were being compelled to plan for probable contraction.

Professor Hasseldine said that it was impossible for Britain to receive its economy or to restore its position in the world until the country realized that investment in innovation was the only rewarding policy for an industrial society.

Extracts from report, page 2

DES figures show parents fail to make up student grants

by David Walker

Nearly three-quarters of university and college students do not have their means-tested grants fully made up by their parents, according to figures published by the Department of Education and Science last week.

Half were owed sums above £50 and a small number more than £250. The figures come from the 1975 Census of Population Censuses and Statistics, which finds that parents' home just under half of this was spent on board and lodging. Of the rest for every pound spent on books £2 was spent on clothes, £3 on travel, £2 on entertainment and £2 on drink.

Considerably less was spent on books by students at polytechnics and colleges than by students at universities. First-year students spent about £7 more a week on average than students in their second or third years.

The NUS said the survey was evidence that students have been caught in an ever-narrowing trap. For example, students in halls of residence spent £407 on board and lodging costs when the grant would at £345.

Undergraduate Income and Spending, Room 1/27, DES, Elizabeth House, York Road, London, SE1 7PH.

Campus Tories launch tax idea

Conservative students have produced a tax-reduction scheme to help parents bear the cost of their children's higher education. Under a covenant lasting six or more years, parents can save up to 35 per cent of the maintenance money they give their student children.

The scheme is being circulated to student unions by the Federation of Conservative Students as a way of reducing what Mr Michael Forth, the chairman, called the burden of parental contributions.

Successor to chief scientist named

Dr Duncan Davies, at present general manager of research and development at Imperial Chemical Industries, is to succeed Sir Teus Madcock as chief scientist at the Department of Industry from April 1, 1977.

Dr Davies will have general responsibility for advising on scientific and technological aspects of strategy.

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Newcastle launches Dr Miller appeal

An appeal for £40,000 to make endowments in medicine and music in memory of Dr Henry Miller the late vice-chancellor of Newcastle University was launched last week.

Dr Miller, chairman of the university's development fund, which is managing the appeal, paid tribute to Dr Miller's courage and leadership.

Dr Miller was a man of wide international reputation who contributed significantly to the life of the region in which he worked.

If the appeal is successful the university will commemorate Dr Miller's professional interest in medicine by establishing a research post in the department of neurology, and his personal interest in music by founding an annual concert or festival.

Social work courses listed

Over 140 courses in universities and colleges leading to professional qualifications in social work are listed in a new booklet for the Central Council for Education and Training in Social Work. Professions and Training in Social Work is available from the Central Council for Education and Training in Social Work, 1, Whitehall, London WC1A 2SS. The booklet costs 15p.

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Australians take more interest in their neighbours

gives us, in his work an operational definition of intellectual integrity. The dangers of teaching becoming indoctrination of the subaltern in the institution of new orthodoxies for older ones are always present, especially in relatively invertebrate disciplines like the social sciences; the danger is greater when deep personal involvement increases the possibilities for these private conversations. And yet, having noted this danger, it is still true that personal dedication when not in the service of a trip to the past can be a powerful force in the moral development of students.

The author is professor of sociology at the University of California at Berkeley. This article is based on a paper presented at the annual meeting of the Educational Research Service.

New promise in synopsis publishing

The Chemical Society's plan for synopsis publishing to start next year is to be welcomed, for the idea has been in the air since the 1920s and a reality in Germany and America. Of course the full, archival journal on microfiche is a stock commercial item, usually offering trade-in rates for clearance of printed back numbers that it can replace.

What is promising about the chemists' plan is the way it squares up to each of a journal's two functions with a mode of output precisely right for both.

It does this very simply. *J Chem Research* will appear monthly in two versions. The microfiche version will carry complete papers, fully referenced and illustrated, with all structure factor tables and background experimental data.

The other version will be the printed synopsis journal, giving key results formulae and leading references only. A subscription to both will cost £65, to the synopsis alone, £10 (including vouchers that may be exchanged for any five papers wanted complete).

Two years of planning have already gone on the scheme. It rests on the validity of the separation of functions theory, which claims that a reader seeking current knowledge from browsing through topics can manage with, indeed benefit from, very much less than the definitive archival text of such papers.

Total synopsis, by the society's editors and authors alike, were run

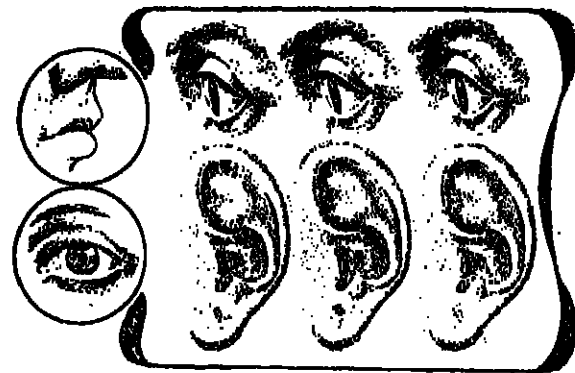
in two dummy versions of both modes. Several authors enjoyed the whole process of self-prefs. For Sir Geoffrey Wilkinson of Imperial College, London, it was fun to have his editor and come in at a full 40 per cent shorter. Professor Carl Djerassi, whose own book on steroid reactions used a kind of chemical shorthand, was enthusiastic about the idea.

Others were less keen. A reader from Ohio said that what he particularly wanted was exactly those details which would go into the archival version. Nor was it agreed that the scheme would result in fewer journals.

What did emerge, however, is that synopsis-micro could suit not merely organic chemistry, its surrounding point, but physical and analytical chemistry too. This possibility would be particularly appropriate and exciting in the case of journals which far from being profitable, currently face closure.

The benefits can be enormous. Vastly reduced bills for paper and printing. Faster throughput of papers (the average delay for acceptance in this summer's *Journal of Entomology* was 161 months) and there may be worse. Quicker delivery of microfiche overseas, for less than the corresponding printed journal sent by surface mail. And not least, fewer words for the majority of readers to feel guilty about.

Commerce will interfere initially. Macmillan would not want a synopsis *Nature*. Nor would Pergamon



Self assessment and slides at staff unit

Many polytechnics have or are developing various forms of staff support in the form of staff development units, educational technology centres or a staff development officer. One of the first separate staff development units was at Manchester Polytechnic and since its inception in January 1972, the range of its activities has gradually increased.

Two current diverse activities which are of general interest to teaching staff are a dissolve-slide projection technique and tutor self-assessment in teaching/learning situations.

The dissolve-slide projection technique is a new approach to slide projection and is currently being investigated by a group of staff concerned with science education.

The interest emerged from witnessing the first European demonstration of the lap-dissolve slide projection technique given by Professors J. P. Snyder and D. N. Harpp at a Chemical Education Conference in Madrid last year. In this visual presentation technique slide sequences are projected from two separate projectors so that the images overlap and dissolve into each other.

The use of the dissolve effect is well established in film and television presentation and dissolve units are being increasingly used with presentation by using a blank screen between successive slides. However, the originality of Professors Snyder and Harpp's technique is based upon exact registration of successive slides. If this is achieved a variety of attractive visual effects can be produced.

The team at Manchester Polytechnic have tried to utilize all the visual aspects of the lap-dissolve technique to improve the presentation of tabulated data, equations and diagrams and the slide sequences are gradually being included in their lecture courses.

The Staff Development Unit this year using microteaching and other activities to provide support for the debate and discussion aspects of teaching which enable participants to refine their own teaching and to learn from the experience of others in their own fields. This will be followed by self-evaluation of one or more slides taken from their normal teaching commitment using video recording to offer a critical and possibly more useful perspective.

Much has been written about the training of teachers in higher education, but many see in the development of their own professional development. A true partnership between staff development, focusing on the needs of individuals, would offer greater prospect of contribution to the development of a stimulating institution. A hesitant step, but the road stretches far ahead.

A travel grant was provided for a member of staff to visit the University of Copenhagen to attend a workshop session with Professors Snyder and Harpp. The skills learned are now being passed on to through the Staff Development Unit. In anticipation of further publications about the technique by Professors Snyder and Harpp, our staff have given demonstrations of lap-dissolve and its application to chemical education in Manchester and also at the Autumn meeting of the Chemical Society at Sheffield, in September.

The authors are Dr J. P. Snyder, Staff Development and Educational Technology Unit at Manchester Polytechnic.

Betty Hollis, Philip Mace, Manchester Polytechnic

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Polytechnic Profile -23 Manchester

Merger has knocked site out from under them

The most difficult task that Manchester Polytechnic has had to face since its designation six years ago is the forthcoming merger in January with Didsbury College of Education and Hollings College, a nearby further education institution. The original troubles of forming the polytechnic from the Manchester College of Art and Design, the Manchester College of Commerce and John Dalton College of Technology are now very much in the past, but the new merger enforced because of the Government's reorganization of higher education, has not only met with some dissent from staff at both the polytechnic and Didsbury but has put away plans to develop the polytechnic on a central campus in the centre of Manchester.

In the early 1970s there were hopes of grouping the polytechnic Manchester Institute of Science and Technology and the Northern School of Music on one large site to be named the Manchester Education Precinct. The polytechnic, at least, those hopes have not been dissolved.

A well-designed new administration block and library, art and design faculty and hall of residence are nearing completion on the area of the precinct surrounding All Saints Square, Manchester, earmarked for the polytechnic. But the economic crisis has delayed the development of more buildings designed to house the faculties of humanities, community studies and management and business. The law department and the students' union have also been delayed.

Student numbers within the enlarged polytechnic are expected to rise. Full time and sandwich students, taking into account course developments, could increase from the present 5,365 to more than 8,000 by 1981 and the projected total is also expected to increase by 1,000 to 7,000.

The polytechnic is currently spread over several sites and annexes in central Manchester. Although the bulk of the work is centred on the precinct, the management and business faculty, the law department and a large part of the faculty of community studies are housed away from the main site.

The merger with Didsbury and Hollings means the polytechnic will find itself with two sites even further apart. Didsbury is five miles away which could pose practical problems in the future. A model of the long-awaited central site within the precinct stands outside the office of Sir Alex Smith, director of the polytechnic. Although still enthusiastic, as is most of his staff, about the concept he is philosophical about the unconnected setbacks of the last few years. But philosophical or not a multi-site polytechnic is remote from the original ideal.

Mr John Holden, his deputy, is a staunch supporter of the central precinct plan. He believes that the concept of building around the square will stay. But modifications have taken place to allow for the fact that we are now keeping a number of dispersed annexes.

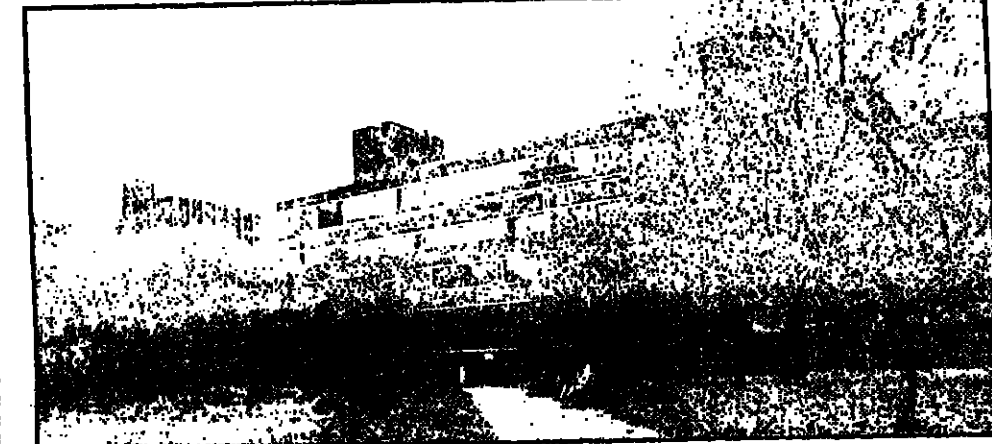
Mr Holden, the former principal of Manchester College of Art and Design, is overseeing the building programme. He is a perfectionist who admits to trying to preserve the highest design standards in spite of the current cut-backs in education spending. His office contains sculpture and art work by polytechnic staff and students, which are seen as an integral part of the environment of the students and staff contributing.

"We have chosen careful colour schemes and prints to try and create a civilized atmosphere. The near to live in have enjoyed the planning enormously. We have gone to great deal of trouble to choose the right furniture and my ambition is to produce the very best sort of buildings at the very worst sort of time."

On his wall a typewritten copy of the inscription discovered on a church plaque in the 19th century: "St Richard Shirley, baronet, founded this church whose singular praise it is to have done the very best thing in the worst times and hoped the most calamitous."

The polytechnic students' union is in a temporary building, once an old warehouse. The students have been pressing for a permanent site for five years but so far their DES. Mr Holden says: "We have done our best under the circumstances but we realize the present building is quite inadequate. The students feel strongly that they have been ignored. They also complain that the lack of housing. Only one hall of residence with accommodation for 160 students is in use competition for beds and face staff in spite of the very efficient polytechnic accommodation service."

Those involved in the original merger of the three constituent colleges which formed the polytechnic in 1970 can recall its first academic board meetings. It was, they say, clinging to their identity as distinct groups. But within months of the creation of the polytechnic many of the old ties had been forgotten. The merger to some extent was



Solemn faces reflect the difficulty of Manchester Polytechnic's task in merging with Didsbury College of Education and Hollings College next January. Report by Sue Reid

unusual in that none of the constituent colleges involved was entirely dominant.

While many other polytechnics created at the same time grappled with the problems of linking smaller institutions with a stronger college of technology the case was almost reversed at Manchester. The Manchester College of Art and Design had a long history dating back to the middle of the last century. It developed as a major institution with a high national reputation. Similarly, the Manchester College of Commerce had roots in the nineteenth century when it was known as the Municipal Evening School of Commerce. In direct contrast, the John Dalton College of Technology was young, set up in 1964 by the local authority to continue and develop work abandoned by the UMIST.

Sir Alex now admits: "The constituent colleges were much more balanced than many elsewhere. Once those on the academic board came to know each other they came to like each other as well. I get the feeling now that people like this institution and want to belong to it. There were no big problems in the early days."

But he is more wary of the current merger and the problems it may present. In May he began to tackle the inevitable redeployment of staff which will almost certainly be necessary. Teacher education in the polytechnic is to be halved over the next five years. One hundred staff at Didsbury and the polytechnic department of education will have to be redeployed because of the Government's planned cut-back in teacher training numbers.

Sir Alex is opposed to redundancies and the polytechnic has won a pledge from the Manchester education authority that these will not be necessary. Consequently, in May a special paper on staff redeployment opportunities to create the enlarged polytechnic was issued by Sir Alex.

It was optimistic and said: "The information assembled in this paper strongly suggests that the additional staff needed for the fulfilment of projected developments can be provided by redeploying staff to cope with the necessary changes." It went on to outline the projected courses developments at the colleges, both those approved and others then in the "pipeline". But now Sir Alex has to admit that the response was distinctly disappointing.

There was very little response. The one thing that now gives me encouragement is meeting and talking to people. A working party has been set up with Didsbury and the

polytechnic and there is a special teacher education study group which is specifically concerned with the merger problems. Sir Alex said: "It is a pleasure to go to the meetings of this study group. I would defy you to tell me which person was from which institution. There is a real sense of concern about teacher education in the Manchester area in these very fluid circumstances."

The teacher training numbers at Didsbury and the polytechnic's education department now total 1,800. If the current national plans for teacher education come to fruition the numbers could drop to under 1,000 by 1980, according to Mr Ken Green, dean of the community studies faculty and of student affairs.

He is outspoken about the role of the DES in the teacher training over the past few years and concerned about the real danger which the academics in teacher education both at the polytechnic and Didsbury now face is these very fluid circumstances.

"I do feel that the so-called rationalization of teacher training by the DES has taken account of the standing of individual institutions, particularly large urban institutions such as Didsbury with a reputation and record of high recruitment of students with strong A-level qualifications." The polytechnic and the college were now trying to find a solution that would meet with teachers' expectations in the two institutions and satisfy the career ambitions of staff.

A Diploma of Higher Education is to be launched by the polytechnic next autumn and is expected to attract an intake of 80 and is to be the second year. Although not yet finally approved by the Council for National Academic Awards the course is seen as an area which could provide redeployment opportunities.

Students will have a choice of six "domains": mathematics, technology, aesthetics, natural sciences, social sciences and humanities. An application has also been made by Didsbury to add a religious studies module to a course that has won approval within the polytechnic.

Dr Chris Maddox, assistant to the polytechnic's dean of studies, said the DHEHE had been planned since 1973. "We wanted to create a course leading to a terminal qualification acceptable to employers but which would also mean students could move onto a second cycle without any loss of time. We expect 70 to 80 per cent of those who move onto a degree not to lose time."

If 80 students are recruited on the DHEHE's first year in 1977 eight extra staff will be needed. When the intake rises to 100 the

following year a further 10 posts may be available.

The polytechnic has worked with Lancaster and Brighton Polytechnics to develop a centrally-administered part-time course in mathematics which is now being run on a national basis at 17 colleges throughout the country. Mr Peter Armstrong, senior lecturer in mathematics at Manchester and assistant course leader of the national mathematics programme, believes that the development could play a major part in the teaching of mathematics in schools.

He said: "The Polymaths course was only launched in 1974 when nine colleges, including Manchester, took part. By September, 1975, 12 institutions were involved and now there are 17." The students—there are 23 on the course at Manchester this year—often enter the one-year programme at below O level standard. They are prepared for entry to either a part-time or full-time degree course in mathematics and the success rate has been extremely high.

Mr Armstrong now believes that the programme could be suitable for the re-training of teachers. "There are only 1.4 mathematicians per secondary school at the moment. The Polymaths course could be used to re-train teachers and prepare them for a degree course."

While the John Dalton faculty of technology was earmarked as the weakest of the three original faculties established at the polytechnic it is now developing fast. But Mr Peter Falkner, its dean, is not prepared to shelter the important sub-degree and part-time work in favour of just degree provision.

He said: "It would be disastrous to try and convert just to degree work. We regard part-time and sub-degree courses as very important." The faculty now offers a range of BSC degree programmes in, for instance, engineering technology, biological sciences, combined studies and mechanical engineering. But a full range of Higher National Diploma courses in chemistry, applied biology, electrical and electronic engineering, mechanical engineering, metallurgy, computer studies and mathematics, statistics and computing are offered alongside.

One of the main strengths of the faculty is the BSC degree course in polymer science and technology (for aspiring technologists in the rubber and plastics industries) which is only offered in a similar form at the Polytechnic of North London. The BSC ordinary and honours degrees in polymer science and technology are designed to complement studies where students build up a study programme centring on two principal subjects chosen from applied physics, chemistry, computing science, geography and mathematics is also seen as something of a coup for the faculty.

The work of the art and design faculty has always been considered highly. A four year sandwich course leading to a CNAAT honours degree in architecture offered by the faculty is, as one academic pointed out, a "jewel in the polytechnic's crown". The third year of the course is devoted to practical training and the polytechnic diploma in architecture follows the degree course.

The department of law, placed outside the faculty system but housed within the faculty of management and business, is another buoyant part of the college. Formed in 1963 within the old College of Commerce it first offered an external London University LLB but in 1966 moved on to launch a CNAAT degree programme. This year there were 1,500 applicants for 110 places.

A centre for the Law Society professional examinations, the department has also started a three-year training course based on full-time study and directed towards "junior" legal assistants. A part-time law degree programme is also in operation.

Lectures, seminars and tutorials on a wide range of subjects are staged by the department of general studies within the faculty of humanities. The department believes that most professional and examination bodies demand some extension of the special subject they control and it is now conducting courses for students in nearly all the faculties within the polytechnic.

In 1974 a document, written by Sir Alex and named "Policy for Development" was issued by the polytechnic. It summarized the aims of the institution as "to be a community to create a sense of equal regard and consideration for all students, degree and non-degree, part-time and full-time; to provide a network of courses with opportunities for transfer; to develop a relationship with other colleges and community groups in Manchester which will allow us to move towards education in a community rather than education in an educational institution; to exert our influence as an educational force in the improvement of life in the north-west region."

High ideals, but ones which in its six years, the polytechnic has gone far towards achieving.

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'Rescue' archaeology in London, as a team of specialists dig on a bombed site due for redevelopment.

This article is based on information supplied by members of NASEE in 21 universities, but the conclusions are those of the author.

The author is Director of the Centre for Russian and East European Studies, University of Birmingham

1. signs are those of the author.

concerned with some aspect of Europe. Applications for admission should be made before March 1 to the DES. Postgraduate grants are payable, he says.

THE TIMES
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Science in privileged ghettos

The House of Commons Select Committee on Science and Technology is almost certainly right in the main thrust of its recent report on relations between universities and industry—the need to establish much more explicit centres of excellence. The committee is as almost certainly wrong in many of the detailed remedies it proposes—differential grants for students or the transfer of Science Research Council funds to the Department of Industry, and even the revival of the Robbins concept of SISTERs (Special Institutions for Scientific and Technological Education and Research).

The urgent need to concentrate scientific and technological excellence in teaching and research in a time of scarce resources cannot be denied. But here the committee is pushing against a door that is already ajar, if not quite open. They appear to underestimate the extent to which this concentration is already taking place through the quiet and informal discrimination exercised by the research councils. The very shortage of funds for research is likely to intensify this discrimination.

The difficulty with SISTERs is not so much the concept but the detail. It may be comparatively easy to designate *en bloc* Imperial, Strathclyde, UMIST and so on as special institutions—although even in these cases the committee's proposal that they should be limited to "training" (not education) and research in engineering and applied sciences seems unnecessarily restrictive. It would be very difficult indeed to establish any acceptable criteria on which such institutions could be carved out of existing universities to form SISTERs. To pose the most difficult question of all—what is meant precisely by applied science?

One problem with SISTERs is that they may turn out to be narrow, one-dimensional institutions which may produce narrow, one-dimensional scientists and technologists; another is that the effect of removing the major centres of excellence and innovation in science and engineering from the rest of higher education will be malignant. It would reduce still further the contact that humanities and social science students have with science and technology and so tend to make such students even less sympathetic to the needs of industry in later life. After all, the complaint that non-science and engineering graduates feel indifferent or even hostile to industry is just as frequent and as serious as the complaint that higher education is not producing enough good graduates in science and engineering. The SISTERs solution would do nothing to help here: it might even exacerbate the problem.

The committee is perhaps trying to run before it can walk. There is certainly a need for greater discrimination in the organization and funding of higher education in the 1980s. But for the past 20 years British universities and colleges have been moving in the opposite direction. To throw the whole machine into reverse without careful preparation is naive and dangerous.

The "problem" of higher scientific and technological education cannot be solved in isolation from the rest of higher education. There is certainly a case for the creation of more specialized institutions like Cranfield or the London Business School. But to hope that a miracle cure can be found by lacking engineering and applied science into a privileged ghetto is vain. More explicit centres of excellence are certainly needed—but across the whole range of subjects not only in applied science, however that may be defined, but in the arts. The creation of SISTERs will have to wait until the practical difficulties have been addressed with much greater precision and rigour and a thorough reorganization of the structure of all higher education is contemplated.

NUS: voice before holidays

The collapse of three of the five National Union of Students services—of which the largest was NUS Travel—is redolent with irony. For years, the union's leadership has assured potential dissenters that, if they deplored the NUS's political tone, they ought to remain members for the sake of the many services it provided to the individual student. The service empire was expanded to increase that appeal. NUS Travel could easily have remained solvent if it had operated according to purely commercial criteria. But the company wanted to offer maximum accessibility and maximum choice to the individual student. The former meant opening and maintaining a number of campus offices that the volume of sales did not justify; the latter meant persisting with holiday routes to Europe, Japan, and elsewhere, for example, that most commercial companies were unwilling to touch, except at "prohibitive" prices. The emphasis of NUS Travel was rightly on such an organization's duty to provide a service, not on its financial survival.

The irony is that the attempt to secure the NUS's place in the hearts (and pockets) of the nation's students has now jeopardized the entire future of the union. The leadership has now to face the stark reality that the NUS is no longer a viable organization. Under the leadership of the NUS's executive committee, the union has been reduced to a mere shell. The NUS's financial position is so dire that it is now impossible to see how it can survive beyond the end of the year.

There is a lesson to be learned from the NUS's collapse. It is that a union which is not prepared to face the reality of its financial position and to take the necessary steps to ensure its survival is doomed to failure. The NUS's leadership must now face the reality that the union is no longer a viable organization and must take the necessary steps to ensure its survival.

LETTERS TO THE EDITOR

Environmental pollution

Sir—The article by Professor Hunt (THE TIMES, November 12) can hardly be called an objective review of the recent Report of the Royal Commission on Environmental Pollution. It reads rather like an exposé of views of a person uncritically in favour of the fast breeder reactor programme. Any part of the Flowers' report which expresses approval of the nuclear energy industry is accepted by Professor Hunt; any part which is critical of the projected expansion of fission energy is rejected by him.

He is of course entitled to his own opinions, and viewed from that angle there is nothing remarkable or original in his article, except for one point. This concerns an issue which the Flowers' report mentions only in passing—as it was not within the remit of the Royal Commission—namely, the proliferation of nuclear weapons. In a plutonium economy, with fast breeder reactors installed all over the world, most nations will in course of time acquire the potential to make nuclear weapons. It is generally accepted that this would increase the probability of a nuclear war, some people see in this the greatest peril of the plutonium economy.

By contrast, Professor Hunt believes that as far as a nuclear war is concerned the nuclear energy industry is in a much more dangerous situation when only one nation possesses nuclear weapons. This means that any

other number provides greater security. One such number might be zero, but Professor Hunt does not advocate nuclear disarmament; instead he sees safety in large numbers, and he implies that the more nations have nuclear weapons the safer the world would be. A logical follow-up would be for him to suggest that all nations should be provided with nuclear weapons forthwith, rather than wait until they laboriously—and at different times—acquire them as a by-product of nuclear reactors.

Professor Hunt obviously assumes that all nations, large and small, have stable governments, and that their rulers always behave in a rational and predictable way. A sober assessment of the world political scene, in recent past and present, immediately shows up the fallacy of this assumption. Furthermore, the probability of a nuclear war starting by accident or miscalculation, clearly increases with the number of nations possessing nuclear weapons. Whatever may be the arguments for or against nuclear energy, it is important to quantify as equally any notion that the proliferation of nuclear weapons would not increase the danger to mankind.

Yours faithfully,
J. R. ROTBLAT,
The Athenaeum,
Fall Mall,
London, SW1V 5ER.

Hostility to polys

Sir—Some serious rebuttals are called for by the hostility to polys shown by Mr Bryan Davies (THE TIMES, November 5).

His second paragraph consists of leading questions and a misleading statement. "The unit total points system" is not used for allocating resources, but for determining the salaries of principals, vice-principals and heads of department.

The third paragraph is misleading in relation to polys, for their main resource is not determined by student numbers and the student-staff ratio. Unit totals are irrelevant, and contact hours used only for equating full-time with part-time students, who are favoured by the system.

The implication in the fourth paragraph that pay depends on qualifications is false for the great majority of polys, for the teachers, who are largely senior lecturers, with some grade II and some principal lecturers; for these grades qualifications have no necessary effect on incremental points. "The notion of credentialism" is irrelevant.

Referring to paragraph six, I do not know of an example of a part-time course being "opened to" or "moved to" a full-time course. The teaching burdens are equally, or more, on polys. The example of how such scrapping could be helpful. On the other hand, Mr Davies gives no example of any polys which have failed to fulfil the aims of the 1966 (Cm 3005) in which they are described as "comprehensive academic communities... for... all levels of higher education" (paragraph 11). "Polys" will be expected to concentrate wholly on teaching courses of higher education. Courses at other levels, however, may well continue for some time, pending... (paragraph 10). The last sentence of paragraph 10 is the original concept has been realized, and the "many different levels" requested by HNC and HND through first degrees to do courses.

In paragraph 10 the polys, already wedged by the high price of rhetoric to credentialism, in paragraph four are accused of "arbitrary" and "arbitrary" decisions. This is a grossly exaggerated assertion. Polys are not "arbitrary" or "arbitrary" at all. They are a necessary part of the higher education system.

Unlike research institutes, polys exist primarily for the discovery of truth, not for the training of students, and polys are as well paid as those else where. Top professionals level apart, the polys are the best paid in the country.

Devolution

Sir—You are to be congratulated on your lucid and very readable article on the devolution of the United Kingdom (THE TIMES, November 12). I might be permitted to underline two points.

The first is that, while there is a strong purely practical case for the devolution of the United Kingdom, the case for a nationalistic devolution is equally strong. I shall not develop this, but readers should know that a group of us, the "Devolution Group", have been working on this in this direction.

The other point is that, while the case for devolution is strong, the case for a comprehensive devolution is equally strong. I shall not develop this, but readers should know that a group of us, the "Devolution Group", have been working on this in this direction.

As for opinion within the staffs, my impression is that they are becoming more and more ardent for the Westminster. The Committee of Chancellors and Principals, announced at an early stage of devolution, they represent but themselves. The University Teachers' Association, which held a poll a year ago, which 1,275 members voted. What the 60 per cent did not vote thought, I think, is an interesting question. Maybe they do not want a key in the lock.

A key term in this is the "forwarding education" document of the Scottish 1975. A "forwarding education" approach to university was taken by a University Committee and Research Council. Scotland was envisaged, the international aspects are unaffected. Because such areas as nuclear science and astronomy can no longer be taken on a United Kingdom and a wider scale is needed. Nations like Scotland should play a vigorous part in it.

Meanwhile, Professor Hunt said that "the argument of devolution of universities to be won in Scotland. The movement has taken the right line, but some of the arguments are by default. The 'A' of the 1975 (S) position has got what it wanted by political means. It follows the political conditions of the day, the status of the universities is guaranteed by the purchase of apparatus seriously impeded progress.

The only other source of money was private donations. At national level, Josephine's engineering scholarships were unique. At local level, subscriptions to promote both local science and university colleges were abundant. The Manchester University Business Communities raised money for their colleges, but other cities were apathetic, even in the boom years of the late 1960s and early 1970s.

One excuse for government reluctance to finance scientific and technical education was that the huge funds of ancient institutions were misused. Why, said the Treasury, should it pay for higher education while universities were sitting on two untapped gold mines worth £700,000 a year? As for technical education, Thomas Huxley thundered that in London "it would be a scandal if a single shilling were not spent on education as long as the city companies after Gladstone took up this cry that the City and Guilds Institute was formed. Like the universities, technical education for the working classes depended on charity reform. Only the House of Commons had said in 1859 that the long purse of the nation could deal with the needs of science, and only open wide for another 30 years, and only because the Government was caught between the claims of publicans and (secretaries). Until then, the Government would not accept that scientific and technical education must be paid for largely by the state.

have enabled the governors of polys to ensure this very important party. The agreement between the Council of Local Education Authorities and the Association of Teachers in Technical Institutions-National Association of Teachers in Further and Higher Education, being modified for some polys, to make contact hours the same for grade II, senior and principal lecturers, so that promotion will not lead to lower teaching hours. Burnham says nothing of contact hours for different grades, but all grades up to and including heads of department count equally for the student-staff ratio.

Yours faithfully,
B. B. LLOYD,
Director,
Oxford Polytechnic.

Overseas numbers

Sir—In your column headed "Polys" do you direct me to overseas numbers? I fear you fall from the high standards of presentation of issues which you customarily set. (THE TIMES, November 12).

The matter under discussion is the number of students who pay fees at the "overseas" rate because they fall within a narrowly defined category of students made by the government in 1967. This is by no means the same as "students from abroad" or "foreign students" and to imply, as you do, that these terms refer to the same students is needlessly ambiguous and could cause distress in a number of quarters.

In passing your wording seems unnecessarily alarmist. When the academic board considered the Inner London Education Authority request it did not regard it as a "discovery". Moreover, the major burden of the ILA paper was the need to ensure that non-"overseas" students were not deprived of places and the polys have complied with this section of the consultative document.

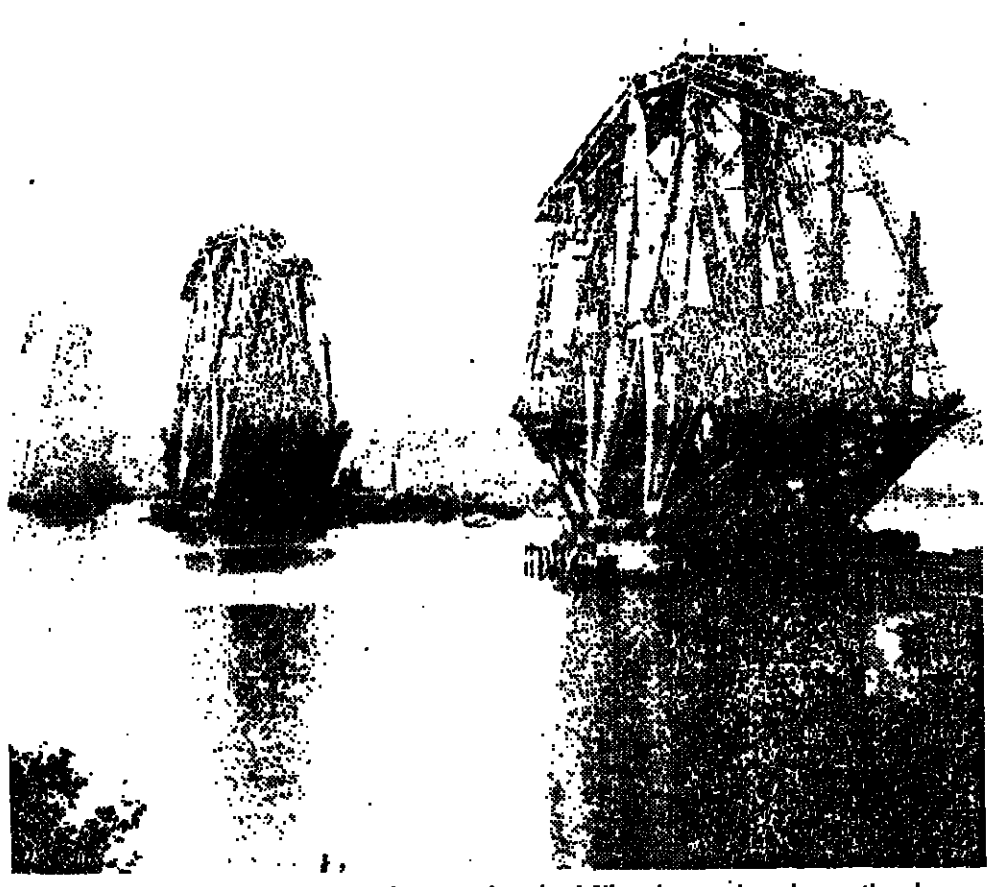
The proportion of students paying fees at the overseas rate remains at 22 per cent, and has not increased, thereby ensuring that the major increase in student fees is in the category for which ILA accept responsibility, for its own ratepayers and for those others contributing to the advanced further education pooling system.

Many members of the academic board were of the view that selection of students should depend only on academic criteria. At that time the economic consequences of deferring implementation of the ILA document were not clear and they have not yet been clarified.

Yours faithfully,
J. R. ROTBLAT,
Academic Registrar,
The Polytechnic of North London.

Department of graduate studies
The Administrative Staff College
Hanley-on-Thames

Lost opportunities in an age of imperialism



Construction work on the Forth Bridge, a triumph of Victorian engineering: other hopes were not fulfilled.

The Select Committee has argued a need for basic changes in scientific and technical education. Margaret Gowing discusses how Victorian society failed to come to grips with a similar situation

In 1870 government expenditure was a much lower percentage of gross national product than in 1850; and in 1890 it was lower still. But collective expenditure was unpopular, and scientific and technical education, despite the pressure groups, had little appeal.

A second underlying cause of Britain's poor scientific and technical education was the administrative structure. The Education Department in Whitehall, which looked after elementary education, and the Science and Art Department in South Kensington both came under the Privy Council Committee on Education, but they were geographically and administratively separated.

The two departments, Playfair complained, were run on contiguous and parallel lines of rails with few crossings lest they should come into violent collision. Secondary education fell in the gap between the departments, while yet another separate body reconstructed the endowed schools.

The many pleas for a Ministry of Education went unheeded until 1899 when an ambiguous board was established. Until then the Department of Science and Art, "a nest of neoplatonism" as it has been called, with extremely mixed functions, remained the arbiter of scientific and technical education. Paradoxically such education suffered when the new board absorbed the department.

The late Victorians, sometimes portrayed as creative administrative reformers, emerge in this story as patchers, improvisers and procrastinators. Moreover administrative practice was too complex; the Science and Art Department's voluminous and changing rules were unintelligible to local committees and students alike.

My third cause of British backwardness is obsession with social class, which appears in almost every page of the great educational reports. When foreign industrial competition alarmed the Victorians, they concentrated scientific and technical education in England upon the artisans, in order to improve their skill, their readiness to accept economic laws and also their character and morals.

The problem was not only which mode was best in whose eye. There were also deeply held beliefs about who should educate whom. It was held that governments should not subsidize the education of those able to pay; especially since many educational endowments for the poor had been diverted to the upper and middle classes.

Thus the Department of Science and Art made no payment by results for middle class students. However, the advance of organized science schools in endowed schools, and the claims of publicans and (secretaries). Until then, the Government would not accept that scientific and technical education must be paid for largely by the state.

who did Victorian England lag behind other Western European countries in scientific and technical education towards the end of the nineteenth century? I shall consider five possible causes. The first is money. The second is administrative structure. The third is social class. The fourth is the influence of the church and the fifth, imperial purpose. Money could come from various sources: central government, local government, fees and private endowments. The role of government was determined by philosophical attitudes to state intervention, and even from this with strong faith in self-help, imbued the Department of Science and Art up to 1870.

In one area, Yorkshire, the department's payments were rejected on the extreme ground that governments should only but not directly intervene in education. Even the 1868 Samuelson report on scientific and technical education said that state aid should be temporary, and that its complete withdrawal would best demonstrate its success. If such education were truly self-interest, self-interest would ensure that people who benefited—whether manufacturers or pupils—would pay for it.

In 1870 the Science and Art Department had seen the light and believed public education to be not a liability but an investment. But governments and the Treasury were not converted. Under the system of payment by results for science classes, the more examinations the greater the payments, so the Treasury insisted on raising examination standards or reducing the number of subjects. They approved new commitments, and perpetually searched for candidates to save.

The Treasury reflected the policy of governments, all of whom—the Liberals most of all—disliked public expenditure on principle. To Gladstone (for so many years Chancellor of the Exchequer or Prime Minister) education was first in the financial creed. Even those supporters of technical education who achieved government office bowed to the doctrine: Lyon Playfair, in 1886 briefly minister in charge of education, for one. Thus most proposals for technical education were doomed. As late as 1887 the Treasury did not want any action at all on technical education because of the cost.

The saddest story is the expansion plans for Robert Owen's College in Manchester. The college wanted to expand its science department, but the Government had "accidentally" subsidized university science and engineering supposedly because Scottish students were too poor to pay the fees.

Darwell's Government promised a grant, but left office before sending the letter. In 1889 Gladstone's successor received a deputation; but fearing to set a precedent, he prevaricated. Another application followed, but a year later no answer had arrived and no grant was made.

Until 1890 with its whimsy windfall—resulting from a government decision to tax beer and spirits and allocate the proceeds to technical education—and the first grants to universities, central government gave little money to scientific and technical education, except through the Science and Art Department.

Governments insisted that responsibility and cost must rest with the localities. "Our Government," they said, "is not a Papyrus." Local authorities however were equally reluctant to finance such education, especially since local, as well as national, expenditure on education was already too heavy. Only the wealthy industrial areas, like Manchester, could play a vigorous part in it.

Meanwhile, Professor Hunt said that "the argument of devolution of universities to be won in Scotland. The movement has taken the right line, but some of the arguments are by default. The 'A' of the 1975 (S) position has got what it wanted by political means. It follows the political conditions of the day, the status of the universities is guaranteed by the purchase of apparatus seriously impeded progress.

The only other source of money was private donations. At national level, Josephine's engineering scholarships were unique. At local level, subscriptions to promote both local science and university colleges were abundant. The Manchester University Business Communities raised money for their colleges, but other cities were apathetic, even in the boom years of the late 1860s and early 1870s.

One excuse for government reluctance to finance scientific and technical education was that the huge funds of ancient institutions were misused. Why, said the Treasury, should it pay for higher education while universities were sitting on two untapped gold mines worth £700,000 a year? As for technical education, Thomas Huxley thundered that in London "it would be a scandal if a single shilling were not spent on education as long as the city companies after Gladstone took up this cry that the City and Guilds Institute was formed. Like the universities, technical education for the working classes depended on charity reform. Only the House of Commons had said in 1859 that the long purse of the nation could deal with the needs of science, and only open wide for another 30 years, and only because the Government was caught between the claims of publicans and (secretaries). Until then, the Government would not accept that scientific and technical education must be paid for largely by the state.

usage; and above all, by church domination of almost all English university education until the civic colleges were founded.

Oxford and Cambridge in particular were essential to the Church's power, and their resistance to its members' laymen was one of the strongest bonds in the union of Church and State. It took 25 years from 1850 to remove religious discrimination from the two universities and the Church connexion was one powerful cause of their inefficiency and low quality.

Oxford, in the nineteenth century, was "virtually a training college for the clergy" while in the last half of the century, the Church took nearly 40 per cent of Cambridge graduates. King's College London also suffered from its Anglican connexion but, mercifully, few Anglican leaders bothered about the civic colleges.

My fifth possible cause of poor scientific and technical education is imperial purpose. It is often said that England turned to producing generalists to govern her expanding Empire, instead of scientists and technologists.

Whatever the other effects of the Empire on the British economy and culture, this charge is misplaced. The educational balance existed long before the new imperialism of the 1880s; moreover India, the chief non-white imperial domain, needed engineers as much as administrators.

The demands were so great after the Indian Mutiny, and the supply of engineers so insufficient, that in 1871 the Royal Indian Engineering College was established. Its graduates could also take industrial posts at home. However, because of the cost, and the fall in demand for engineers, the college closed in 1904.

What were the consequences of Victorian England's small and tardy development of scientific and technical education? 1870 is a long time ago. Or is it? It is within living memory at one remove and people educated before 1900 were the governing generation in industry and politics even after the Second World War.

Thus, if Babbage, the Prince Consort, Playfair, Samuelson and their friends, all deservedly in heaven, now study there the current economic league tables with Britain around the bottom they must be saying "we told you so."

Playfair might reiterate the question he put in 1885: "How is it that we find wide branches of manufactures, when they depend on scientific knowledge, passing away from this country in which they originated, in order to engrave themselves abroad, although their decay and ruin remain in our hands?"

The relative (not of course absolute) British industrial decline that began about 1870 is so well documented that I shall not marshal the evidence. There were exceptions but as a leading historian, David Landes, has written: "all the evidence points to the technological backwardness of most of British manufacturing industry—on loads lost, opportunities missed, markets relinquished that need not have been."

Most economic historians seek objective, primarily economic, explanations ranging from markets and currencies to the complexity of Britain's inherited industrial structure. In this interpretation, education is scarcely mentioned, and such views at variance with our current disenchantment with the results of recent large educational expenditure.

But a smaller group of historians do accept that Britain's failure in the nineteenth century to develop the education system essential for national efficiency was a main cause of this decline. I am on their side.

Britain had achieved so much in the early nineteenth century, with so little education, that she had felt no need to improve the educational infrastructure which her potential competitors were building in advance of their industrialization. Despite weighty evidence on the need for scientific and technical education, the infrastructure had not been created. In Britain, where the century added to the time of the human lifespan, the blood of the nation was not being nurtured in a tradition where such education counted for little. Technical change flowed in the blood neither of the entrepreneurs nor the workers. The divorce of the upper and middle classes from science and even more from technology—set a norm for those who climbed the social ladder behind them.

Midnight is sometimes called the most reliable form of prophecy. But the prophecies of the 1870s about scientific and technical education were sober foresight. Some historians are determinist, concluding that prevailing doctrines justify, as well as explain, subsequent events. But as one modern German historian has said, the historian should restore to the past the freedom of choice it once had.

The author is professor of the history of science at Oxford. This article is an edited extract from the *Wilkins Lecture* given at the Royal Society on November 4; the complete lecture will appear in *Proceedings of the Royal Society*.

The author gratefully acknowledges the help she has received from three doctoral theses by J. Blanchet, Oxford 1952; H. Butterworth, Sheffield University 1968 and P. R. Sharp, Leeds University 1973.

BOOKS

Opposites

Forthcoming events

John Dryden: a Survey and Bibliography of Critical Studies, 1895-1974
by David J. Latt and Samuel Holt Monk
University of Minnesota Press
\$20.00
ISBN 0 8166 0774 5

A Bibliography of Shelley Studies 1823-1950
by Clement Dunbar, with a foreword by Donald H. Reiman
Dawson, £19.00
ISBN 0 7129 0674 6

In that revolution in poetic taste which Eliot accomplished between the wars, Dryden had a crucial role, for, as one writer put it, "... Eliot used Dryden as a club with which to belabor the Romantics, as a lever with which to exalt the Metaphysicals". The writer was Samuel Monk, whose 1950 check-list of Dryden studies has now been updated and expanded by David J. Latt.

... if certain twentieth-century critical essays were the only ones to survive into the twenty-first century, the scholars who discovered them might decide that they were no equivalent of sermons; that the duty of criticism was, in our era, deemed to be a demonstration of the critic's moral superiority to literary characters and, occasionally, the assertion of his moral superiority to the creators of those characters as well.

which has tripled, he points out, since the first edition—he has followed Monk's general plan. He includes sections on *Festschriften*, bibliographies, editions, biographies, general and specific criticism, and Dryden's foreign reputation. Each section is divided alphabetically by authors' names, which, though helpful in one way, precludes any examining of bibliographical sequences.

Late provides author and subject index and bibliography. The index indicates the scope of "selective entries" in the text. Asterisks "identify works ... of exceptional value or which develop new points of view or which are of special interest" and in his general survey I think he shows clearly a chance that has occurred since Monk-shift from evaluation to resource. The list reader. His sympathies are with such scholars as Phillip Harlan who propose "different and interesting consuming background reading projects. Although he is not the rather limited claims even Dryden's principal admirers, for Johnson to Van Doren and Elton and records of those who are not such distinctly unfavourable comments as those of Harold Wendell Smith, C. S. Lewis and F. R. Leavis, he does not point out alternative readings, but rather encourages a wider range of texts.

La Bona Florence of Rome is a tall-rhyme romance, written with considerable skill and verve, and possessing the special interest of being an analogue of *The Man of Straw*. The manuscript edition of this work has been available for many years, but this is the first with a full glossary. The introduction includes a long discussion of the various versions of the Florence story, which serve chiefly to demonstrate the futility of scholarly source studies. There are also perceptive comments on the local merits of the romance and some brief remarks, which might well have been expanded, on the ambivalent attitude toward women implied by such stories.

If Dryden was offered as an excellent source by Heller, then his principal fault by the anti-Drydenists is that he was not. Heller's American views, was Shelleys the subject of Clement Dunbar's book. To follow the story of Shelley's reputation up to 1950 (when annual *Shelley* began in the *Keats-Shelley Journal*) he has arranged material chronologically. The material is divided into three sections. Entries are in alphabetical order (although the type of material indicated by symbols) and, as the index gives only authors and titles of periodicals in which articles indexed appeared, it is hard to find items on specific topics or works. Lists and appendices of Shelley's paintings, drawings, but the plans are different. Dunbar's book

The edition is marred, however, by some distressingly plausible errors, such as *Beauvis* for *Beauvis*, *Hungary* for *Hungary*, *caw* for *caw*, *inobstrusive* and *Capallanus*. The title page contains several errors, such as "the first edition" for "the first edition". The text is also full of errors, such as "the first edition" for "the first edition". The text is also full of errors, such as "the first edition" for "the first edition".

partly, as Donald H. Reiman says in his foreword, to "enable us to construct critical history".

The introduction outlines such history, from the variety of responses in the latter years after Shelley's death, through the rise of his reputation, at its height around 1836, to the time when his work met the hostility of the New Humanists: More and, especially, Babbalanja's teacher at Harvard.

Edwin J. Howard's *Geoffrey Chaucer* is described by the publisher as a "fresh and stimulating account." It is certainly not fresh, having been first published in the United States in 1964, and now appearing with no visible revisions even to the bibliography. It is also not stimulating. It is a thorough, pedestrian account of Chaucer's life and work, critically sophisticated and including some pleasing summaries. It is manifestly inferior to the comparable short studies by Brewer, Coghill, Russey or Lawlor, and I can see no reason for its reappearance.

In these surveys Dunbar perhaps has the same sense that the material he has listed is itself a part of history. "Shelley's life and works," he can write, "are still read for pleasure, but they have become the property of the academic community." This is surely at least as true of Dryden, but if Latt agrees, he does not say.

A. C. Spearing **Geoffrey Soar**

bear in some way on Chaucer, the most important is undoubtedly that by Donald R. Howard. It is large in scale, ambitious, intelligent, learned,

Of these five books, all of which

and more impressive in its local detail than in its overall structure. Overwhelmed by the variety of its ideas, I write in a state of some

... the established idea of *The Canterbury Tales* as unfinished is not because Chaucer refused to write more tales, but because he created a literary form and structure, a literary ideology whose possibilities were inexhaustible. The idea itself, which is complete, makes the work "unfinished."

is true: namely that by the brilliant initial invention of the *General Prologue* Chaucer created a sort of universal relativizing machine into which he could insert any tale or treatise, newly written or rescued from the back of a cupboard, and it would automatically become inexhaustibly intriguing, because world.

would never know how far
expressed the attitudes of its teller
and how far those of Chaucer
himself. Even unfinished narratives
of which Chaucer probably had
several lying about, he judges, from
the evidence.

Fame, The Legend of Good Women, and other abandoned poems, could take their place as interrupted tales and thus gain a new dimension of possible significance.

...though exactly how far is un-
certain because he uses such a con-
fusingly large battery of overlap-
ping concepts, with idea, form,
structure, and metastructure all hav-
ing separate meanings. He al-

analogies for the organization of the Tales; the work is like a pilgrimage, a flower, a decorated initial, a mappa mundi, a diptych, the interlaced pattern of romance and manuscript.

Such analogies can be helpfully suggestive, but here too multiple suggestions dazzle and confuso. The analogy pressed further is the interlace, and (to summarize crudely) Howard sees the tale as

linked by immensely complex patterns of interrelationship, involving "thematic juxtaposition and contrast" and including, even those "floating" tales that are not explicitly linked to groups. The work

admit "multiplicity and formlessness" Howard is easily clever enough to recognize possible objections to his undertaking: "The question is whether thematic structuring is an artistic

work, or whether it gets into the work by accident, whether it is just part of the random structure of life itself or the world. Disparaging as such a recognition is:

100

Reliable

A Laboratory Manual of Qualitative Organic Analysis
by H. T. Openshaw
Cambridge University Press, £2.75
ISBN 0 521 29112 7

The arrival of Openshaw's text on the market in a paperback version will be greeted by an older generation with murmurs of sentimentality. Here it is in its third edition of 1955, apparently entirely unchanged.

It was perhaps the first of its genre when it appeared in 1946: a systematic approach to qualitative organic analysis built upon a series of tests for functional groups, applied in a specified order, and, in quite the preface, "it has proved reliable in dealing with substances and mixtures such as are likely to be encountered by the student". Although it was followed by others, notably the fuller text of Wild which curiously is now out of print although from the same publishers, Openshaw did indeed prove to be reliable, and was trusted by many a generation of students who greeted with relief its clear enunciation of tests and the excellent tables of derivatives.

But times are harsher now. The number of organic compounds that are placed before a student may not be conveniently limited to the simpler structures, and the determination of structure is more realistically achieved by the use of infra-red and n.m.r. spectra. No attempt has been made in this reprint to bring nomenclature up to date, and this only serves to underline how the book has dated. It must be stated that there are better, and more appropriate books of organic qualitative analysis available, but with other volumes to supply spectra data it is probable that this little book will still find a niche among those consulted by the student of today when seeking to characterise the unknown put before him by his teachers.

John Biggs

NEW FROM PENGUIN

Literature

SAMUEL JOHNSON
THE HISTORY OF RASSELAS, PRINCE OF ABISSINIA
Edited by D. J. Enright
Johnson's only novel was written within eight days. It is a brilliantly sustained exploration of the nature of happiness, the vanity of human ambitions and the terrible power of the imagination. But it is the manner of the telling which fascinates: Johnson's humour, solidity of wisdom and verbal skill were never more tellingly displayed.

Penguin English Library 86p

Sociology

CLASS IN A CAPITALIST SOCIETY
A Study of Contemporary Britain
by Robert Miles and John Goldthorpe

The new social class analysis is a myth. By using Britain as an example, the authors show how deeply rooted and pervasive class structures and divisions are in contemporary capitalist societies. They conclude that contrary to popular pretence, 'class' is alive and well and flourishing.

Penguin £1.50

CRITICAL SOCIOLOGY

Edited by Paul Connerton
An outstanding collection of 21 readings illustrating the intellectual lineage of the Frankfurt School, reaching back to Marx and Hegel, the link with the hermeneutic tradition and the problems with which the critical theorists have concerned themselves.

Penguin Education £1.50

Aspects of membrane function

Basic Biology Course 5: Cell Membranes
by Michael Tribe, Michael R. Kraut and Roger K. Snek
Cambridge University Press, £5.00 and £2.50
ISBN 0 521 20737 1 and 20738 X
Biological Membranes, their Structure and Function
by Roger Harrison and George Lunt
Blackie, £7.80 and £3.90
ISBN 0 216 90072 7 and 90073 5

Until recently it seemed that every year saw the emergence of new hypotheses and models for biological membrane structure. Happily, because of advances in membrane research we are past that stage. There are now certain valuable generalizations that can be made about membrane structure, and within this context, membrane biologists' attention is focused on much more detailed aspects of structure and mechanism underlying the biochemical and physiological functions of membranes.

Both these books are concerned with how this state of affairs was reached, and consider aspects of membrane function. However, the emphasis given to various topics, the intended level of target audiences and manner of presentation are so different that to review them together would only lead to inappropriate and unfair comparisons.

Cell Membranes forms part of an integrated elementary undergraduate course written by the Nuffield Inter-University Biology Teaching Project team at Sussex. Like the other books in the series, it is a programmed text with information questions and answers arranged sequentially. Initially the student is palisaded over through the classical work of Overton, the nature and structure of phospholipids, and on Robertson's unit membrane hypothesis to the mosaic model of

membrane structure. The electron micrographs that the student is directed to use in a critical way to distinguish between possible membrane structures are well chosen and clearly reproduced.

However, in some respects the pathway to modern ideas on membrane structure is rather too pointless. For example, the importance of membrane flexibility and fluidity is mentioned, but the role of the phospholipids in achieving this is not made clear. The thoughtful student may well wonder: Why are phospholipids present in membranes? Why not purely protein membranes? His thoughts will not be helped by the superficial, and in places misleading, treatment of phospholipid-water systems.

There is a short, rather idiosyncratic, section on the passive permeability of cell membranes. The final sections are concerned with active transport. The treatment of phagocytosis and pinocytosis is excellent at the level of what can be deduced from electron and light microscopy. The other active transport processes are dealt with less satisfactorily. At a superficial level all seems well, but a student looking in more detail at the data and 'correct' answers will find inconsistencies that can only lead to confusion.

The ideal programmed text for any laboratory course for undergraduates rewards the student's positive and perhaps naïve enthusiasm without discouraging more thorough thought about the topic. **Cell Membranes** falls short of this target. For this reason the book should only be used in close association with plenty of tutorials. Most tutors would probably prefer to use their own approaches in introducing students to the subject.

Biological Membranes, their Structure and Function is a more advanced book, suitable for second and

third-year undergraduate biologists and biochemists. The authors have produced a readable and comprehensible text that well reflects trends in biochemical aspects of membrane research.

The first three short chapters set the scene, introducing different membranes and their role in the life of the cell. Before describing molecular composition and structural organization, the authors consider the important problem (so often avoided in undergraduate texts) of how to obtain pure membrane preparations. The importance of membrane carbohydrate is emphasized in a chapter on cell surface specificity.

This leads logically on to two chapters describing membrane mediated processes that depend on transport activity. The usual examples of oxidative and photosynthetic phosphorylation, light and chemical receptors, facilitated and active transport are covered, with one exception, in a clear and lively way. The exception is the short section on measurement of the membrane potential. Slight confusion here reflects that the book is written by and for biochemists rather than physiologists. Thus throughout, emphasis is given to topics that can be discussed in molecular terms. Clear distinctions are drawn between what is known at this level and what is speculation. It is shown that many ideas on structure-function relationships of natural membranes can be shown to be feasible by the use of artificial lipid and lipid-protein membranes.

The book is well laid out with clear illustrations and electron micrographs and carefully selected reading lists. It will be valuable to students for both reference and general background reading.

G. T. Rich

From covalent bonds to photochemistry

Mechanism and Theory in Organic Chemistry
by Thomas H. Lowry and Kathleen S. Richardson
Harper & Row, £13.25
ISBN 0 06 040862 1

This large book is intended for senior undergraduates and for first-year graduate students in the United States, who have already had a year's course in organic chemistry.

Its general coverage and arrangement is not becoming traditional in a book of this kind. Involving chapters on the covalent bond, some fundamentals of physical organic chemistry; acids and bases; bimolecular substitution reactions; related reactions; intramolecular rearrangements; addition and elimination reactions; reactions of carbonyl compounds; radical reactions; perturbation theory and symmetry; the theory of pericyclic reactions; applications of the pericyclic selection rules; and, finally, photochemistry.

The book is unusual in that consideration of pericyclic reactions,

including the necessary theoretical background, constitutes about one-fifth of the whole. The degree of emphasis is a conscious choice of the authors, made because they believe that pericyclic theory is the most important mechanistic development of the post-decade, and that it will have an increasing impact in the future. An opinion that is not shared by all organic chemists.

The general treatment is sensible and useful—the authors believe in mechanistic theory as a device for the organization and correlation of the vast mass of organic chemical data, rather than as an end in itself. This underlying attitude is often reflected in the choice of examples, and in the nature, extent and depth of the explanations that are offered. Quite often there is only one reference to where particular experimental information actually comes from, but also some account of how it may be translated into meaningful statements about molecular events.

There is a useful selection of problems at the end of each chapter, and reference is given to the relevant literature where these problems involve matter in addition to that already presented in the text. The general layout of the book is quite good, the reproduction of structure formulae is adequate, but could have been better. There are extensive references to the original literature.

One relative novelty is the use of the authors make of three-dimensional reaction coordinate diagrams, substitutions, in elimination reactions, and acid-catalysed carbonyl addition reactions. These are quite interesting, but I feel that students are somewhat unlikely to adopt them; the probability is that they will stick to the two-dimensional variety, which are so much easier to reproduce and to handle.

Relatively minor criticisms apart, this is a book that can be highly recommended: it largely succeeds in accomplishing what it sets out to do, and there are not very many books of which that can be said.

Peter Sykes

Case studies on plant pollutants

Chemical Principles of Pollutant Effects on Plants
by R. A. G. Harrison and J. A. Harrison
Cambridge University Press, £8.50 and £3.80
ISBN 0 521 21087 9 and 29039 2

Except in local areas around urban-industrial sites, the effects of air pollutants on plants are much less obvious than those of drought, and it is with these less dramatic effects that this book is concerned. It contains little argument of the kind environmentalists nowadays among hard facts on which such argument may be sensibly based.

The opening contribution gives a sound outline of the process of gaseous exchange between plants and atmosphere, and sets the scene for the following eight contributions, which deal with the fundamental botanical and

chemical principles of pollutant effects on plants, but represent a series of case studies on the more important gaseous air pollutants and heavy metal particulates.

The studies range from systems to the sub-cellular level and cases, including enzyme reactions, and especially the report by N. A. H. and others on sulphur dioxide, which provides an early warning of adverse air conditions. Some of the two or more pollutants; however, there are still valid reasons for critical studies with single pollutants, especially at low concentrations over long periods.

One author comments that many of the biochemical changes caused by pollutants at the sub-cellular level may be initiated by processes demanding energy that might

otherwise be used for growth by the plant. It is worth questioning whether we can expect to detect the result at the whole plant level, confronted as we may often be with unexplained variation and large errors for the measured parameters.

The book is well prepared with few typographical errors or editorial omissions: it has a useful index and excellent bibliography. It is a pity that the book is not a little more critical of the authors' own work, and that it is not a little more critical of the work of other authors. It is a pity that the book is not a little more critical of the work of other authors. It is a pity that the book is not a little more critical of the work of other authors.

D. W. Cowling

Reference pamphlets

UK libraries

University Libraries in Britain
by Bryan Harrison, reports on a survey of 61 libraries representing 42 universities in the United Kingdom. In part one he surveys the role of the university library in the United Kingdom, and discusses the different types of university library in Britain. In part two he surveys the role of the university library in the United Kingdom, and discusses the different types of university library in Britain.

Selecting text

Developing the Library in Political Science
by J. Harman, is concerned with selection of a library's collection. The author discusses the role of the library in political science, and provides a list of recommended titles. The book is published by the British Library, and is available for £6.00.

Pressure group

The Guardian Directory of Pressure Groups
edited by Peter S. Jones, published by W. H. Allen, £7.50. This directory lists over 2000 pressure groups, and provides a comprehensive overview of the activities of these groups. It is published by the Guardian, and is available for £7.50.

Transport plan

The Department of the Environment
by the Department of the Environment, published by the Department of the Environment, £2.55. This book provides a comprehensive overview of the transport plan for the United Kingdom, and is available for £2.55.

Shastri lecture

A. K. Das Gupta's 1944 Memorial Lecture
by A. K. Das Gupta, published by Oxford University Press, £2.50. This lecture provides a comprehensive overview of the Shastri lecture, and is available for £2.50.

The Angolan war

After Angola: The War in Southern Africa
by Colin Leys and Tony Hughes, published by the British Library, £2.50. This book provides a comprehensive overview of the Angolan war, and is available for £2.50.

Useful words

A Dictionary of Economic and Social Science
edited by S. E. J. Taylor and Glyn Thomas, published by the British Library, £2.50. This dictionary provides a comprehensive overview of economic and social science, and is available for £2.50.

Secondary science

The results of research in secondary science
published in a monograph by the British Library, £2.50. This monograph provides a comprehensive overview of the results of research in secondary science, and is available for £2.50.

Changing Scotland

Our Changing Scotland: A Year of Scottish Government
edited by M. G. Clarke and published by the British Library, £2.50. This book provides a comprehensive overview of the changes in Scotland, and is available for £2.50.

Reappraising Sartre

Existential Marxism in Postwar France
from Sartre to Althusser
by Mark Poster
Princeton University Press, £11.00
ISBN 0 691 02122 4

Sartre and Marxism
by Victor Gollancz, £6.95
ISBN 0 901759 97X

Existentialism and Sociology
a Study of Jean-Paul Sartre
by Ian Craib
Cambridge University Press, £6.95
ISBN 0 521 21047 X

One of the marks of a new thing constantly being discovered in his work, and that the impression that contemporaries have of him may change radically in the course of time. This has obviously been the case with Jean-Paul Sartre. When *Le temps est un autre* first appeared it was thought by the majority of Anglo-Saxon philosophers to be a typical example of continental pseudo-philosophy at its worst. Sir Alfred Ayer explicitly compared Sartre's talk of being with the Real King's talk of being with the Real King. Later, however, people began to find in it philosophical points that were of interest and importance and today it comes as no surprise to find Sartre quoted or discussed in philosophical articles written in English.

Much the same applies to the *Critique de la raison dialectique*. In spite of the comparative degree of understanding of the earlier work this was heavily condemned when it first appeared, partly because critics failed to see what Sartre was trying to do. One of the problems was the importance given to Marxism and here the difference between the European and the English experience is vital. In this connection Mark Poster's book will be very helpful, as an essay in the history of ideas, in particular of the relation between philosophy and politics. He follows the renaissance of Hegel and later of Marx in France in the pre-war period and then traces in detail the complex relations between the policies and views of the Communist party and a variety of French thinkers. Sartre bulks large among them. For an English reader the insight provided is valuable, both in order to understand the background of much recent French philosophy and as an interesting comparison with the Hegel revival in Britain at the end of the last century.

Green and Bosanquet found in

the *Critique de la raison dialectique* a more radical and more interesting work than the earlier one. In the *Critique*, Sartre is doing a more interesting and more difficult job in trying to use Sartre for sociological purposes. One of the problems which obviously arises here and which Ian Craib discusses is whether sociology is possible as a separate academic discipline or should it really be sublated into philosophy. This argument is often attributed to Peter Winch. Sartre also could be seen as undermining the possibility of sociology as an empirical study and replacing it by some form of conceptual analysis. Indeed much of the failure to appreciate the *Critique*, to which I referred earlier, is due to philosophers taking Sartre to be engaged in an empirical sociological exercise rather than a conceptual one.

In the course of his book Ian Craib confronts various sociological investigations with the tools which have been acquired from Sartre. Readers unfamiliar with the articles he cites may well find they need to refer to them to follow the details of his points. The book

approach needs the others: "the whole production of the social sciences must be by its breadth and variety provide the subject with the eclecticism it needs".

Blondel makes high claims for both the necessity and the difficulty of political studies, but he is modest about its scientific status. "The notion of constraint" is embedded in the discipline. The study of politics is a labour of Sisyphus. "That political explanations are simple is one of the delusions which brings to political thought many outsiders. Thinking politically requires training, requires a complete plan or pattern of the subject, even if some sections are tentative, or go beyond the strict limits of 'behaviour'. A more venturesome writer might have attempted some speculation and synthesis, and more substantial reference to evidence outside the Anglo-American.

But textbooks need teachers to use them intelligently. In this case there is work for the teacher in setting out the framework and providing substantial reference to evidence outside the Anglo-American.

Blondel takes one of Blondel's strands, the behavioural, and offers a reconstruction based on the substantial topic: political culture, local politics, and voting behaviour. His method is to give an account of the subject through critical summaries of the major research-based abstracts, diffuse, and unattractive. But there is a unity behind the differences, and each

reader a clear and substantiated account of the topic. The method has the merit of conveying the substance of which general statements may be sustained. The disadvantage is that occasionally a large subject is represented by a comparatively restricted study. Thus, for example, Chicago and New Haven inevitably dominate the discussion of American, and for that matter British, local politics. The topics seem sometimes to be writers rather than politics. Clearly there is a good academic justification for this approach, but sometimes the student may need to see a complete plan or pattern of the subject, even if some sections are tentative, or go beyond the strict limits of 'behaviour'. A more venturesome writer might have attempted some speculation and synthesis, and more substantial reference to evidence outside the Anglo-American.

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P. J. Madgwick

BOOKS

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Need-written roman minuscules, alternates and punctuation, from Edward M. Catich's portfolio. One of the illustrations in Calligraphy Today by Heather Childs, published by Studio Vista at £4.50.

A marginal masterpiece

Enquiry Concerning Political Justice and its Influence on Morals and Happiness
by William Godwin
edited by Isaac Kramnick
Penguin, £2.25
ISBN 0 14 040030 3

The complete text of Godwin's *Political Justice* is now published for the first time anywhere since 1946, for the first time here since 1842, and for the first time in a cheap form since it appeared in 1793 and escaped prosecution because of its price. At last it is easy to get hold of one of the marginal masterpieces of British political thought, in a fat paperback reprint of the author's definitive third edition of 1798. That is the one good thing about this addition to the Penguin Classics; unfortunately there are several bad things about it.

First, the publisher has got the title wrong; although the original title-page is reproduced in the book, the new title-page refers to "modern" morals. The publisher, illustrating the front cover with an irrelevant cartoon by Cruikshank, has also got his name wrong. Above all, the editor has got the book wrong.

Isaac Kramnick provides a long introduction containing an account of Godwin's life and work which is too detailed and is also damaged by the assertion that *Political Justice* is "the bible of anarchism". Kramnick begins: "Every political philosophy has its prophet and its sacred text." Even if that were true

The fact is that Godwin was not in general terms, it is untrue in this particular case. "Anarchism" has no exception, he continues. "Its prophet is William Godwin and its first sacred text, his *Enquiry Concerning Political Justice*." This is nonsense—*anarchism* has no prophet or sacred text, and even if it did they would not be these.

an anarchist but a precursor of anarchism, that *Political Justice* is an exposition not of political but of philosophical anarchism, and that its direct influence was not on anarchists but on earlier socialists and secularists. As Kramnick admits, Godwin rejected two elements of historical anarchism: activism and collectivism; some anarchists reject these elements, too, but they also reject Godwin's moralism and optimism. Kramnick is able to argue his false assertion only by ignoring what anarchists have actually said about Godwin—just as clearly committed to a rather similar analysis of the event. Chodri on the other hand moves at too abstract a level to consider actual happenings—but if he had mentioned them it is clear he would have disapproved and taken the same line as the Communist party.

These three books testify to the amount of interest that can still be generated by the writings of Sartre. Whether we like it or not he is still a figure to be reckoned with.

Anthony Manser

Eclectic v. ecumenical approach

Thinking Politically
by Jean Blondel, £3.95 hb, £2.25 pb
ISBN 0 7045 0147 3 and 0229 1

Political Behaviour
by Howard Picton, £8.00 and £3.25
ISBN 0 416 81790 4 and 81800 5

Blondel brings the opportunity, at the end of the day, of explaining to 18-year-olds what they may expect of their study of politics, and, at the same time, to the television university teachers of politics discussing learnedly to respectful interviewers. To the undergraduates we explain that politics is not necessarily an unsavoury and despicable activity; to the (less responsive) television we must then show that politics is not current affairs. Blondel's new book may help us through our autumnal doubts.

His concern is with types of "thinking politically". There are three: normative, structural, and behavioural. The old and unfashionable distinction between theory (Aristotle, Hobbes, etc.) and practice (Cabinet, Parliament, etc.) is discarded. "Behaviour" (including behavioural "simplicity theory"), which once seemed to claim the whole territory, is fitted into place. We are all theorists now, and all are empiricists (like Aristotle, etc.). In part Blondel concedes, these are conflicting approaches, which arise from a reflexive, abstract, diffuse, and unattractive. But there is a unity behind the differences, and each

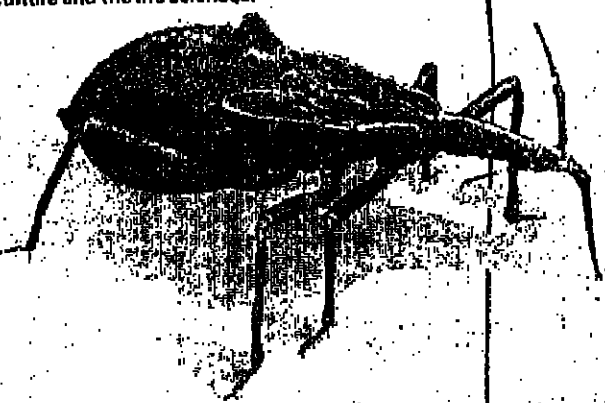
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P. J. Madgwick

V. B. WIGGLESWORTH, F.R.S.
Insects and the Life of Man

224pp Hardback: £6.00 Paperback: £3.25

This distinguished scientist presents to a general audience the fruit of his thinking spanning fifty years involved in research and applications of entomology. The essays and addresses presented here touch on the relationship between science and the economy of mankind, share some of the excitement and intellectual rewards of scientific research and describe important contributions insect studies have made to ecology, medicine, agriculture and the life sciences.



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